

REMARKS

In the current, December 22, 2006 Office Action, claims 3 - 11 and 13 - 21 were noted as pending in the application, and all claims were rejected. By this response, no claims have been canceled, no claims have been amended, and no new claims have been added. Thus, claims 3 - 11 and 13 - 21 are pending in the application. The rejections of the Office Action are traversed below, and reconsideration of the pending claims is respectfully requested.

Interpretation of Claims 3, 4, and 6 - 11

On pages 2 - 3 of the Office Action, Claims 6 and 7 are interpreted as reciting only "threshold adjustment logic." As a basis for ignoring many of the limitations of claims 6 and 7, the Office Action relies on M.P.E.P. § 2114 and concludes that "claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function," thereby allegedly justifying truncating the examination of all of the recited elements of claims 6 and 7. The Office Action asserts on page 3 that a similar constraint is appropriate for claims 3, 4, and 8 - 11.

In stark contrast to the use of section § 2114 in the current Office Action as justification for ignoring express claim elements, this section of the M.P.E.P. instead stands for the proposition that a prior art reference disclosing all of the recited structural elements of a claim, but operating in a different manner from the invention, may still anticipate the invention: The apparatus claims of the current invention are directed to integrated circuits. Elements of integrated circuits may be described in a variety of different ways. Due to their complexity and the fact that there may be multiple ways to configure an integrated circuit to perform an identical function, functional language in an apparatus claim that recites circuit elements may be used to describe the structure of the circuit. See, for example, the claims of U.S. Patent No. 5,287,292 to Kenny et al., as relied upon in the Office Action as a valid reference for rejecting all pending claims herein.

M.P.E.P. § 2114 does not provide any basis for granting the Examiner license to ignore functional elements of a claim that further limit or define structural elements of the claim, as may be recited in claims 3, 4, and 6 - 11. In fact, M.P.E.P. § 2143.03 expressly instructs the Examiner to address every claimed limitation. *See Perkin-Elmer Corp. v. Westinghouse Elec. Corp.*, 822 F.2d 1528, 1532 (Fed. Cir. 1987) (the court cannot ignore a

plethora of meaningful limitations in a claim). Further, contrary to the assertions of the Office Action, function stated in an apparatus claim can be relied upon to distinguish the claim from prior art. *See In re Stencil*, 828 F.2d 751, 754-55 (Fed. Cir. 1987).

It is respectfully submitted that each of the elements of claims 3, 4, and 6 - 11 are to be examined by the Examiner and compared against the prior art, and that it was error to fail to so examine the claims.

Rejection of Claims 3, 10, 14, and 20 under 35 U.S.C. § 103(a)

On pages 5 - 8 of the Office Action, Claims 3, 10, 14, and 20 stand rejected under 35 U.S.C. § 103(a) in view of the combination of U.S. Patent No. 5,287,292 to Kenny et al.; U.S. Patent No. 4,602,872 to Emery et al.; and U.S. Patent No. 5,233,161 to Farwell et al. This rejection is respectfully traversed.

Under a rejection based on 35 USC § 103(a), the Examiner bears the burden of showing a *prima facie* case of obviousness based upon the prior art. *In re Roufett*, 149 F.3d 1350, 1355, 47 U.S.P.Q.2d 1453, 1455 (Fed. Cir. 1998); *In re Fritch*, 23 U.S.P.Q.2d 1780, 1783-84 (Fed. Cir. 1992); MPEP § 2142. To establish a *prima facie* case of obviousness under 35 U.S.C. § 103(a), three basic criteria must be met: (1) the scope and content of the prior art are to be determined, (2) differences between the prior art and the claims at issue are to be ascertained, and (3) the level of ordinary skill in the pertinent art is resolved. *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17-18, 86 S.Ct. 684 (1966). Against this background, the obviousness or nonobviousness of the subject matter is determined. *Id.*

When applying Section 103(a), four tenets of patent law must be adhered to: (1) the claimed invention must be considered as a whole; (2) the references must be considered as a whole and must suggest the desirability and thus the obviousness of making the combination; (3) the references must be viewed without the benefit of impermissible hindsight; and (4) a reasonable expectation of success is the standard with which obviousness is determined.

Hodosh v. Block Drug Co., Inc., 786 F.2d 1136, 1143 (Fed. Cir. 1986). Moreover, mere identification of each claimed element in the prior art is insufficient to negate patentability. *In Re Rouffet* at 1357. Instead, there "must be a teaching or suggestion within the prior art, or within the general knowledge of a person of ordinary skill in the field of the invention, to look to particular sources of information, to select particular elements, and to combine them in the way they were combined by the inventor." *ATD Corp. v. Lydall, Inc.*, 159 F.3d 534,

536 (Fed. Cir. 1998). Otherwise, sophisticated scientific fields would rarely, if ever, experience a patentable technical advance. *In re Rouffet* at 1357.

An Examiner's analysis concluding that it would have been obvious to combine known elements in the prior art should be made explicit. *KSR Int'l v. Teleflex, Inc.*, 127 S.Ct. 1727, 1741, 82 U.S.P.Q.2d 1385 (2007) (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)). It is important to identify the benefit/reason that would have prompted a person of ordinary skill in the art in the relevant field to combine the elements in the way the claimed invention does. *KSR Int'l* at 1741, 1744. To establish a *prima facie* case of obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 180 U.S.P.Q. 580, 582 (C.C.P.A. 1974); MPEP § 2143.03. In the absence of a proper *prima facie* case of obviousness, an applicant who complies with the other statutory requirements is entitled to a patent. *In re Roufett* at 1355.

Claims 3, 10, 14, and 20 are directed, in circuit and method form, to an integrated circuit with a plurality of thermal sensors located on the integrated circuit, an averaging mechanism to calculate an average temperature from the sensors, a register storing a threshold temperature, and interrupt logic to generate an interrupt if the calculated average temperature exceeds the threshold temperature. Claims 10 and 20 recite the additional feature of displaying information regarding the calculated average temperature to a user of the integrated circuit.

The Office Action concedes that Kenny neither teaches nor suggests a plurality of thermal sensors, a thermal sensor located on an integrated circuit, or an averaging mechanism. The Emery reference, directed to the non-analogous art of an electric generating system, is introduced to allegedly disclose the use of a plurality of temperature sensors and calculating an average temperature from the plurality of sensors. The Office Action admits that the Emery reference also fails to teach locating thermal sensors on the integrated circuit. The Farwell reference, also directed to non-analogous art of circuit testing and circuit burn-in testing, is introduced to allegedly disclose placing a temperature sensor on an integrated circuit. The Office Action then concludes that not only does the Kenny, Emery, and Farwell combination teach all of the elements recited in claims 3, 10, 14, and 20, but also that it would have been obvious to combine the teachings of these three reference to render obvious the elements recited in claims 3, 10, 14, and 20.

Notwithstanding the assertions of the Office Action and the selective use of the Kenny, Emery, and Farwell references, even the combination of the Kenny, Emery, and Farwell references, were such a combination to be made, fails to teach or suggest each of the elements recited in claims 3, 10, 14, and 20. For example, independent claims 3, 10, 14, and 20 recite a plurality of thermal sensors sensing temperature at a plurality of different locations on an integrated circuit. As admitted by the Office Action, Kenny discloses a single temperature sensor located near an integrated circuit (emphasis added). Farwell discloses a single temperature sensor located on an integrated circuit (emphasis added) (see Farwell at Col. 2, lines 52 - 57), and Emery does not disclose temperature sensors on integrated circuits at all and instead discloses single temperature sensors in each of a plurality of water cooling tubes located downstream from an electrical generator (see Emery at Col. 2, lines 17 - 22; Col. 3, lines 49 - 53) (emphasis added).

Assuming for purposes of argument that Kenny and Farwell were to be combined, at best, the Kenny/Farwell combination would teach an integrated circuit with a single temperature sensor on or near the integrated circuit. If Emery were to be added to the mix, the result might be a downstream temperature sensor reading the temperature of the air downstream from the circuit. Accordingly, neither a two-way combination or even the three-way combination of the Office Action teaches or even suggests a plurality of thermal sensors located on an integrated circuit as recited in claims 3, 10, 14, and 20.

Further, contrary to the assertions of the Office Action, the Kenny, Emery, and Farwell references are not in analogous art, and thus one of ordinary skill in the art would not have been motivated to combine them. The Applicant notes that the Kenny patent is directed to subject matter similar to that of the present application, namely having a thermal sensor for monitoring and controlling the temperature of an integrated circuit while in operation (see the abstracts of the present application and Kenny). In contrast, Farwell is directed to temperature sensing during circuit reliability testing to ensure that a circuit is operating above a given temperature such that burn-in testing of the circuit can proceed without the use of burn-in ovens (Farwell at Col. 1, lines 7 - 10; Col. 2, lines 32 - 37; Col. 3, lines 55 - 65). Kenny discloses a maximum operating temperature for the circuit to be 50° C (Kenny at Col. 2, lines 17 - 26). The Farwell system, intended to test the circuit for failure, sets a target temperature to be achieved during burn-in testing to be a minimum of 125° C and to expose the circuit to that temperature for an extended period of time (Farwell at Col. 1, lines 21 - 29).

There is no reason the person of ordinary skill in the art of integrated circuits, in possession of the Kenny system for monitoring and controlling the temperature of an integrated circuit while in operation, would look to the oven-less burn-in testing system of Farwell that heats integrated circuits to more than twice the operating temperature that is acceptable under the Kenny system -- nor has the Office Action presented any such reason other than to assert, without support, that both patents are drawn to the broad region of thermal measurement and control.

One of ordinary skill in the art would not have been motivated to combine Emery with either Kenny or Farwell, alone or in combination. In contrast to the integrated circuit subject matter of Kenny and Farwell, Emery is directed to cooling an electric generator with water, wherein a single temperature sensor is positioned in each of a plurality of water tubes, located downstream from the generator, to derive the temperature of the cooling water being discharged from having cooled the generator (see Emery at Col. 2, lines 17 - 22). The Office Action introduces Emery to allegedly teach a plurality of temperature sensors. However, the sensors of Emery are not positioned on a single device for sensing the temperature of that device, as recited herein. Instead, Emery discloses a single temperature sensor being provided for each of a plurality of water cooling discharge tubes for an electric generator, each for sensing the temperature of the water in a particular discharge tube, not the generator itself (Emery at Col. 3, lines 50 - 54).

A person of ordinary skill in the art of temperature control of small, even tiny, integrated circuits, with knowledge of a Kenny/Farwell combination, would have absolutely no reason to look to electrical generating systems where the device to be cooled fills a room, consists of multiple moving parts, and relies on water for cooling. First, the Kenny and Farwell patents disclose sensing of the temperature of an integrated circuit with a single temperature sensor, with no reason to add the enormous, additional components of an electrical generator system to the circuit. Second, sensing of the down-stream cooling water of Emery has no application to the electronic integrated circuit environment of Kenny and Farwell, and the Kenny/Farwell artisan would have no reason to look to the water cooling system for the electric generator of Emery. Finally, at best, the Kenny-Farwell-Emery combination would disclose an integrated circuit having a water cooling system wherein the circuit has a single temperature sensor located on or near the circuit.

The Examiner is required to explicitly explain the reasons why a person of ordinary skill in the art would have a reason to combine the teachings of the Kenny, Farwell, and Emery patents to render the claimed elements obvious. The Office Action fails to explain why a skilled artisan would have a reason to combine the teachings of Kenny, Emery, and Farwell to allegedly render each and every element of claims 3, 10, 14, and 20 obvious. For example, as described above, there is no showing why a person of ordinary skill in the art could or would combine these three references to teach an integrated circuit having a plurality of thermal sensors located at a plurality of locations on an integrated circuit for sensing the temperature of the integrated circuit, as recited in claims 3, 10, 14, and 20. Without a plurality of thermal sensors located at a plurality of locations on an integrated circuit, it is respectfully submitted that the claimed averaging mechanism and function is also not taught by the references, alone or in combination.

For at least these reasons, independent claims 3, 10, 14 and 20 are believed to be patentably distinguishable over the Kenny, Farwell, and Emery references, either taken alone or in combination. Accordingly, it is respectfully requested that the rejection of claims 3, 10, 14, and 20 be withdrawn.

Claims 4 - 9 depend from claim 3 and include all the features of that claim plus additional features. Therefore, for at least the reasons set forth above with respect to claim 3, it is submitted that claims 4 - 9 patentably distinguish over the Kenny, Farwell, and Emery documents, and withdrawal of the rejection of claims 4 - 9 is respectfully requested.

Claims 11 and 13 depend from claim 10 and include all the features of that claim plus additional features. Therefore, for at least the reasons set forth above with respect to claim 10, it is submitted that claims 11 and 13 patentably distinguish over the Kenny, Farwell, and Emery documents, and withdrawal of the rejection of claims 11 and 13 is respectfully requested.

Claims 15 - 19 depend from claim 14 and include all the features of that claim plus additional features. Therefore, for at least the reasons set forth above with respect to claim 14, it is submitted that claims 15 - 19 patentably distinguish over the Kenny, Farwell, and Emery documents, and withdrawal of the rejection of claims 15 - 19 is respectfully requested.

Claim 21 depends from claim 20 and includes all the features of that claim plus additional features. Therefore, for at least the reasons set forth above with respect to claim

20, it is submitted that claim 21 patentably distinguishes over the Kenny, Farwell, and Emery documents, and withdrawal of the rejection of claim 21 is respectfully requested.

Summary

In summary, the Applicant respectfully submits that the Examiner has failed to establish a *prima facie* case of obviousness against claims 3 - 11 and 13 - 21. More specifically, the Examiner has not shown how or where the prior art teaches or suggests all the claimed limitations. As discussed above, even the combination of the references fails to teach all of the features recited in claims 3 - 11 and 13 - 21. Further, the Examiner has failed to explicitly identify why a person of ordinary skill in the art would combine the Kenny, Farwell, and Emery references together in the manner recited in the pending claims. Accordingly, the Applicant respectfully requests the rejection of claims 3 - 11 and 13 - 21 be withdrawn.

If any fees are required in connection with this RCE and Response, please charge such fee to Bingham McCutchen, LLP Deposit Account No. 50-4047.

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